REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Inactivated drawing and changed manufacturer's eligibility.	5Jun87	[signature]

INACTIVE FOR NEW DESIGN AFTER 5 Jun 87
USE MS27400

Prepared in accordance with DOD-STD-100

Selected item drawing

REV STATUS OF PAGES														
	REV	A		A		A								
	PAGES	1	2	3	4	5	6	7	8	9	10	11	12	13

Original date of drawing:
11 July 1985

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CHECKED BY James R. Martin

APPROVED BY Steven B Searcy

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO

RELAYS, PERMANENT MAGNET DRIVE, 10 AMPERE, 4 PDT, ALL WELDED, HERMETICALLY SEALED (SIMILAR TO MS27400) (32 V DC MAXIMUM COIL VOLTAGE AT +85°C MAXIMUM)

SIZE	CODE IDENT. NO.	DWG NO.
A	14933	84193

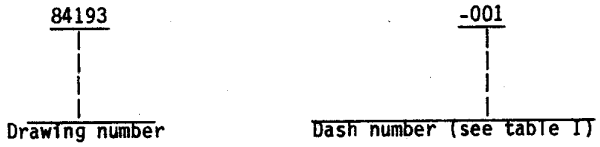
REV A

DESC FORM 144 MAR 76 AMSC N/A
FSC 5945-E035

1. SCOPE

1.1 Scope. This drawing describes the requirements for a hermetically sealed electromechanical relay. This drawing provides a level of quality and reliability assurance for acquisition of relays in accordance with MIL-R-6106 except as specified herein (see 3.4). The relays supplied to this drawing shall be subjected to all the tests as specified for type I-ER relays in the group A table of MIL-R-6106 for a M level relay (see 4.2).

1.2 Part number. The complete part number shall be as shown in the following example:



2. APPLICABLE DOCUMENTS

2.1 Government specifications and standard. Unless otherwise specified, the following specifications and standard, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-R-6106	-	Relays, Electromagnetic (Including Established Reliability (ER) Types), General Specification For.
MIL-G-45204	-	Gold Plating, Electrode Deposited.

STANDARD

MILITARY

MS27400	-	Relay, Permanent Magnet Drive, 10 Ampere, 4 PDT, All Welded, Hermetically Sealed.

(Copies of the specifications and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following document forms a part of this drawing to the extent specified herein. The issue of the document which is indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

Aerospace Material Specification

AMS 3332	-	Rubber, Silicon Extreme Low Temperatue Resistant.

(Application for copies should be addressed to the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096).

2.3 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-R-6106, MS27400, and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-R-6106, MS27400, and herein (see figure 1).

3.3 Coil data and operational data. See tables II and III.

3.3.1 Operate time. Operating time shall be 15 milliseconds maximum with rated coil voltage.

3.3.2 Release time. Release time shall be 15 milliseconds maximum from rated coil voltage.

3.3.3 Contact bounce. Contact bounce shall be 1 millisecond maximum.

3.3.3.1 Break bounce normally open contacts only. .1 millisecond maximum.

3.4 Physical. Physical requirements of the relay shall be as specified in MS27400 and herein (see table I).

3.4.1 Dimensions and configuration. See figure 1.

TABLE I. Mechanical and physical characteristics.

Dash numbers 84193	Terminal type	Mounting configuration	Superseding part numbers MS27400-
-001	Solder pin	A	47M
-002	Socket pin	A	No superseding part
-003	Solder pin	B	38M
-004	Solder hook	B	29M
-005	Socket pin	B	31M
-006	Solder pin	C	No superseding part
-007	Solder hook	C	30M

TABLE II. Operating characteristics.

Coil data									
Nominal		Max		Max pickup voltage			Dropout voltage 2/	Hold voltage 2/	Coil suppression (back EMF) V dc 2/
Volts	Res. ±10% at 25°C	Volts 1/	Ampere	Normal 2/	High temp. test	Cont. current test			
28	290	32	.12	18	19.8	22.5	1.5	7.0	42.0

1/ Maximum ambient temperature of +85°C.

2/ Over the temperature range.

TABLE III. Rated contact load (amperes per pole) case grounded. 1/

Type of load	Life operating cycles X 10^3	28 V dc				115 V ac, 1 phase				115/200 V ac, 3 phase 2/				See appropriate notes
		Main		Aux		Main		Aux		Main		Aux		
		NO	NC	NO	NC	400 Hz	50/60 Hz	400 Hz	60 Hz	400 Hz	50/60 Hz	400 Hz	60 Hz	
Resistive	100	10	10			10	2.5 3/			10	2.5 3/			
Inductive	10						2.5 3/				2.5 3/			
Inductive	20	8	8			8				8				4/
Motor	100	4	4			4	2 3/			4	2 3/			
Lamp	100	2	2			2	1 3/			2	1 3/			
Transfer load														4/
Mechanical life reduced current	400	2.5	2.5			2.5				2.5				
Intermediate current		Applicable per specification												

1/ Time-current relay characteristics at 25°C (see table IV). Relays shall sustain five applications (make and carry only) of power concurrently on adjacent poles at each of five different current levels for the time durations in table IV. Separate relays shall be tested at 28 V dc and 115/200 V ac, 400 Hz, 3-phase. Cooling time between successive applications shall be 30 minutes. The test shall be performed on both normally open and normally closed contacts of each relay. There shall be no failures or evidence of welding or sticking and relays shall pass contact voltage drop at conclusion.

2/ Absence of value indicates relay is not rated for 3-phase applications.

3/ For 50/60 Hz rating, rupture and overload not applicable and life shall be 10,000 cycles.

4/ Transfer load indicates relay suitable for transfer between unsynchronized ac power supplied at rating indicated.

TABLE IV. Time current relay characteristics at 25°C.

1	15A - 1 hour
2	50A - 5.0 seconds
3	100A - 1.2 seconds
4	250A - 0.2 second
5	350A - 0.1 second

CAUTION: Compare with time current characteristics of the associated circuit protective device.

3.5 Environmental characteristics. Relays shall meet all environmental requirements as specified in MS27400, except maximum ambient temperature shall be +85°C.

3.5.1 Electrical characteristics. Relays shall meet all electrical characteristics as specified in MS27400 and herein.

3.6 Marking. Marking shall be in accordance with MIL-R-6106 except the part number shall be in accordance with 1.2 herein. The "MS27400-XXM" part number shall not be used.

3.7 Quality assurance requirements. Relays furnished under this drawing shall have been subjected to, and passed all the requirements, tests, and inspections detailed herein.

3.7.1 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-R-6106 and 4.2 herein.

3.8 Certification as an approved source of supply. In order to be listed as an approved source of supply for relays manufactured to this drawing, a manufacturer shall:

a. Agree to make available to DESC, upon request, all pertinent test data on its production of the subject part, including, but not limited to, test data in accordance with the qualification inspection table of MIL-R-6106, type I ER; and

b. Provide to DESC-EMD or its designated agent, upon request, free of charge and without obligation, a current production sample from its production of the subject part; and

c. Meet one of the following criteria:

(1) Currently possess listing on qualified products list QPL-6106 for at least one part; or

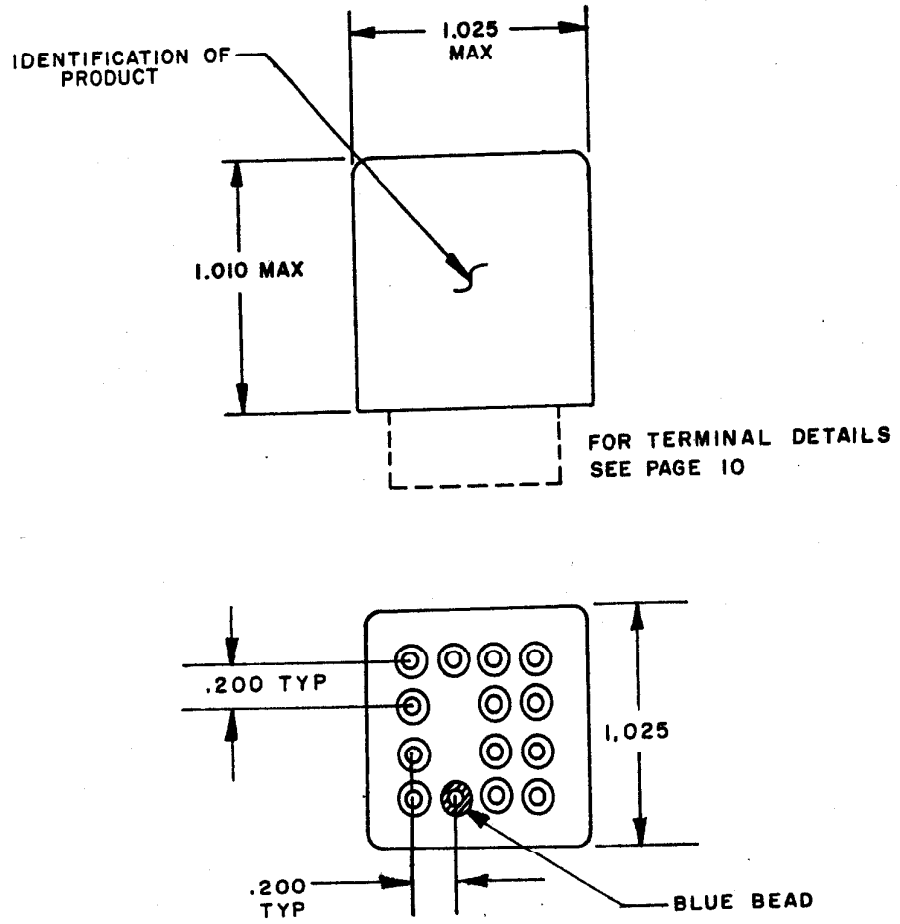
(2) Be in current production of the subject part.

3.9 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply (see 6.6 and 6.7).

3.10 Supersession data. See table I.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection shall be in accordance with MIL-R-6106, except as modified herein.



CONFIGURATION A

FIGURE 1. Outline drawing (for details see table I).

DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 84193
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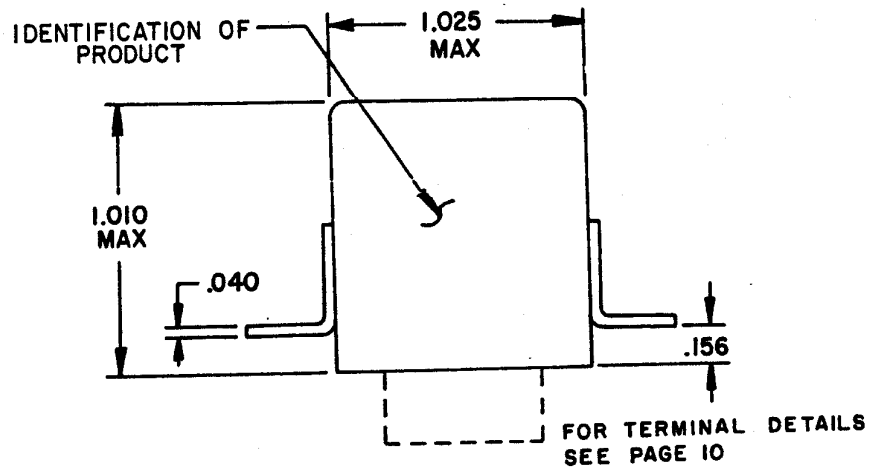
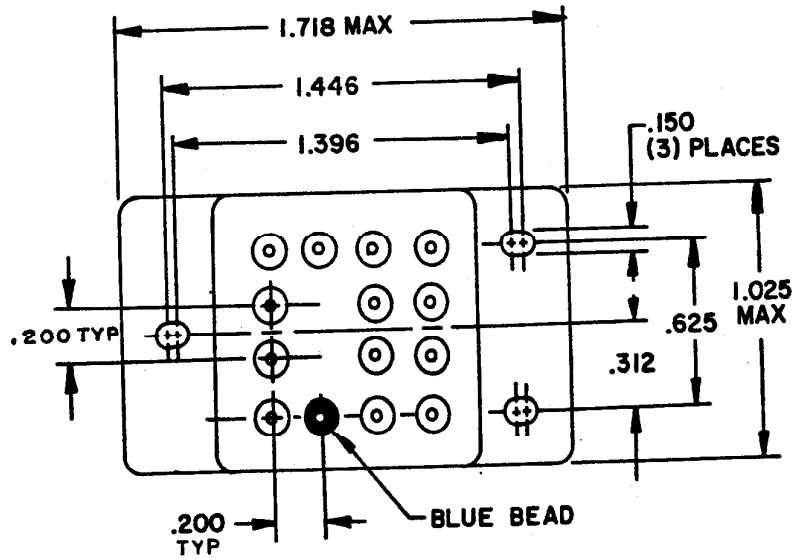
MAR 76





CONFIGURATION B

FIGURE 1. Outline drawing (for details see table I) - Continued.

DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 84193
		REV	PAGE 7

DESC FORM 144A
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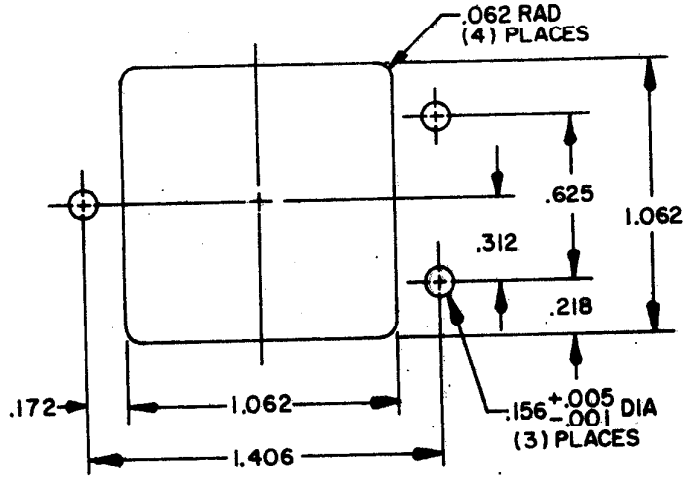
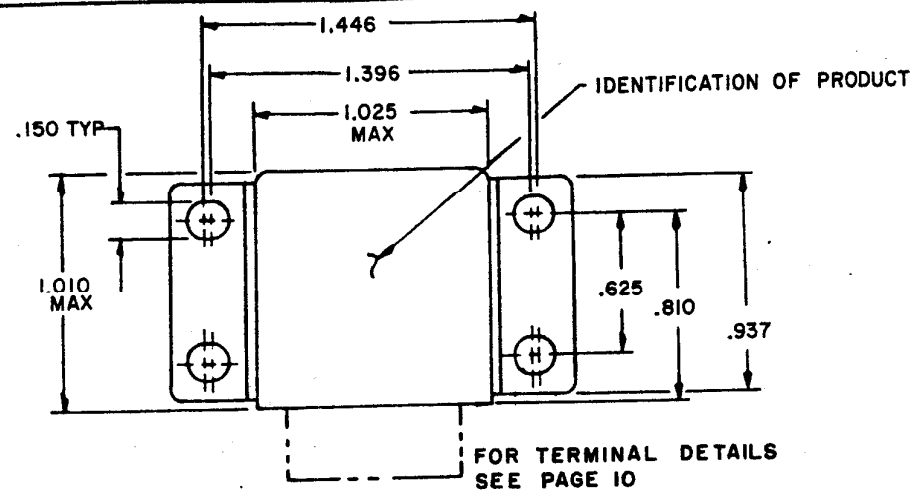
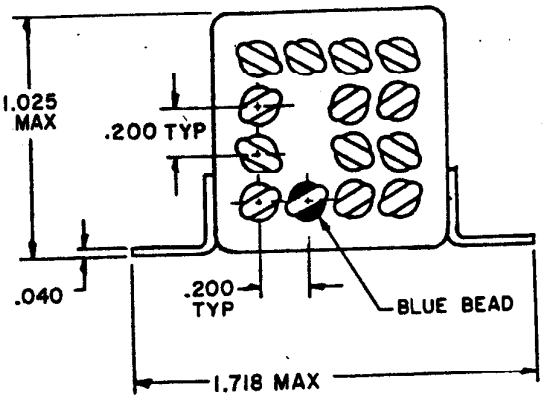


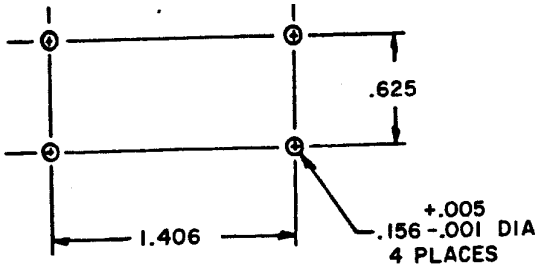
MOUNTING HOLE LAYOUT FOR ALL
SOLDER-HOOK TERMINALS

MOUNTING HOLE LAYOUT
CONFIGURATION B

FIGURE 1. Outline drawing (for details see table I) - Continued.







MOUNTING HOLE LAYOUT
CONFIGURATION C

FIGURE 1. Outline drawing (for details see table I) - Continued.

DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 84193
		REV	PAGE 9

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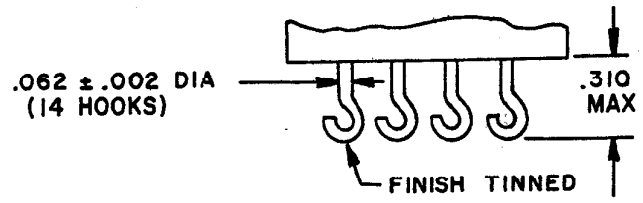
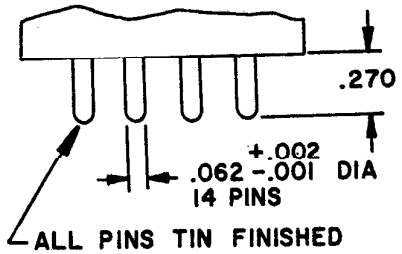
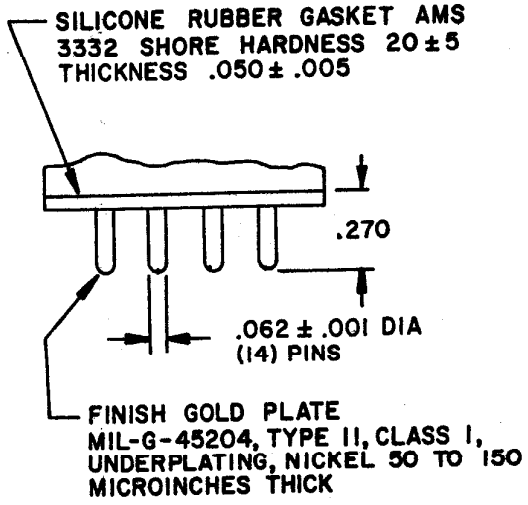


SOLDER-HOOK TERMINAL



SOLDER-PIN TERMINAL



SOCKET PIN TERMINAL

TERMINALS

FIGURE 1. Outline drawing (for details see table I) - Continued.

DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 84193
		REV	PAGE 10

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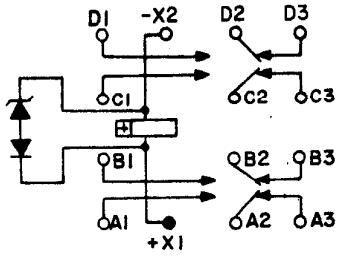
MAR 76



Inches	mm	Inches	mm	Inches	mm
.001	0.03	.172	4.37	.937	23.80
.002	0.05	.200	5.08	1.010	25.65
.005	0.13	.218	5.54	1.025	26.04
.040	1.02	.270	6.86	1.062	26.97
.050	1.27	.310	7.87	1.396	35.46
.062	1.57	.312	7.92	1.406	35.71
.150	3.81	.625	15.88	1.446	36.73
.156	3.96	.810	20.57	1.718	43.64

NOTES:
1. Terminal numbers need not appear on the relay header. There shall be affixed to the relay a suitable legible circuit diagram that identifies each terminal location specified.
2. Metric equivalents are given for general information only.
3. Dimensions are in inches.
4. Unless otherwise specified, tolerance is ±.010 (0.25 mm).
5. For design feature purposes, this drawing takes precedence over acquisition documents referenced herein.
6. Referenced documents shall be of the issue in effect on date of invitation for bid.
7. Upon application of reverse polarity these relays shall not operate or be damaged.
8. DC versions of this relay must not operate or be damaged by reverse polarity. Semiconductors shall not be used for this purpose.
9. Permanent magnet drive consists of permanent magnet with its flux path switched and combined with the electromagnet flux.
10. For details see table I.

FIGURE 1. Outline drawing (for details see table I) - Continued.

4.2 Quality conformance inspection. Quality conformance inspection shall be in accordance with group A listing of MIL-R-6106. Group A testing shall be performed on each inspection lot and manufacturers shall keep lot records for 3 years (minimum), monitor for compliance to the prescribed procedures, and observe that satisfactory manufacturing conditions and records on lots are maintained for these relays.

4.2.1 Group A inspection. Group A inspection shall consist of all tests specified in MIL-R-6106 for failure rate level "M". For seal test, the radioisotope procedure shall be performed.

4.3 Inspection of packaging. Inspection of packaging shall be in accordance with MIL-R-6106.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-R-6106.

6. NOTES

6.1 Notes. Only definitions of the notes specified in MIL-R-6106 shall apply to this drawing.

6.2 Intended use. Relays conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for O.E.M. application. This drawing is intended exclusively to prevent the proliferation of unnecessary duplicate specifications, drawings, and stock catalog listings. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-6106, this drawing will become inactive for new design. The QPL-6106 product shall be the preferred item for all applications.

6.3 Ordering data. The acquisition document should specify the following:

a. Complete part number (see 1.2).

b. One copy of the quality conformance inspection data as required in 4.2 to be shipped with each lot.

c. Requirements for packaging and packing.

6.4 Replaceability. Relays covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.5 Comments. Comments on this drawing should be directed to DESC-EMD, Dayton, Ohio 45444, or telephone 513-296-6184.

6.6 Submission of certificate of compliance. The certificate of compliance submitted to DESC-EMD, prior to listing as an approved source, shall state the manufacturer's product meets the requirements herein.

6.7 Approved sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. The vendors listed herein have agreed to this drawing and a certificate of compliance (see 3.9) has been submitted to DESC-EMD.

DESC drawing part number 84193	Vendor CAGE number	Vendor similar part number
-001	99699	ES-410-1492
-002	"	ES-410-1493
-003	"	ES-410-1494
-004	"	ES-410-1495
-005	"	ES-410-1496
-006	"	ES-410-1497
-007	"	ES-410-1498
-001	35344	K-A1N-109
-002	"	K-A4N-109
-003	"	K-D1N-109
-004	"	K-D2N-128
-005	"	K-D4N-109
-006	"	K-J1N-109
-007	"	K-J2N-109
-001	78290	FCA-410-305
-002	"	FCA-410-306
-003	"	FCA-410-307
-004	"	FCA-410-308
-005	"	FCA-410-309
-006	"	FCA-410-310
-007	"	FCA-410-311

Vendor CAGE number	Vendor name and address
99699	Deutsch Relays, Inc. 65 Daly Road East Northport, NY 11731
35344	Leach Corporation, Relay Divison 5915 Avalon Boulevard Los Angeles, CA 90003
78290	Struthers-Dunn, Inc. Pitman, New Jersey 08071